

REMARKS

Claims 1-20 are pending in the application. Claims 14 and 20 have been amended to correct obvious typographical errors.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 14 and 20 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Claims 14 and 20 have been amended to indicate that the reduction of heat refers to step (c). As the rejection has been addressed, it should be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being obvious over Geiger et al., "Influence of Sulphur on the Formation of Dioxin/Furan during Sewage Sludge Incineration (English Translation)" (hereinafter "Geiger") in view of U.S. Patent No. 5,505,766 to Chang (hereinafter "Chang"). The Examiner suggests that it would have been obvious to use the waste gas purification of Chang on the waste gas of Geiger in order to efficiently purify the gases.

The present invention is directed to a method that reduces dioxin levels from a process that produces dioxins that includes the steps of:

- (a) adding sulfur, or another halogenation suppressant, or mixtures thereof to a composition containing dioxin precursors,
- (b) incinerating the composition containing dioxin precursors, thereby forming a gaseous medium,
- (c) reducing heat in the gaseous medium formed in step (b),
- (d) removing ash from the gaseous medium,
- (e) adding an adsorbent to the gaseous medium formed in step (d), and
- (f) removing acid gases and particulates from the gaseous medium formed in step (e).

Geiger teaches the influence of sulfur on the formation of dioxin/furan during the incineration of sewage sludge, domestic refuse and special refuse. In a fluidized bed oven, the sludge is dried, crushed and incinerated. Inert components (ash) are drained out with the waste gas. The waste gases are then purified by removing dust, sulfur dioxide, hydrogen chloride and heavy metal in electrofilters and a waste gas rinsing apparatus. Geiger does not specifically disclose the details of a waste gas purification system.

Specifically, Geiger does not disclose removing the ash from the gaseous medium, adding an absorbent, and removing acid gases and particulates.

Chang discloses a method for removing pollutants, such as mercury, from a combustor flue gas. The method includes the steps of supplying sorbent to a baghouse having a filter bag therein until the filter bag is coated with a predetermined amount of sorbent and introducing the flue gas into the baghouse. Pollutants in the flue gas are sorbed by the sorbent on the filter bag.

It is well established that to establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed. Cir. 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496, (CCPA 1970).

Geiger does not provide a motivation to modify the method taught, to practice the claimed invention, and obtain the results obtained by Applicants. Geiger fails to provide any teaching leading to an expectation that removing ash from the gaseous medium, adding an adsorbent to the gaseous medium thus formed, and removing acid gases and particulates from the mixture of gaseous medium and adsorbent thus formed would produce the results Applicants have obtained.

In the present invention, Applicants sought to provide an affordable, effective process to reduce dioxins at an industrial scale. However, the Examiner suggests that Applicants should look to the field of metal removal, for example mercury, as disclosed in Chang in order to solve the problem. The Examiner has not provided any incentive that would motivate a skilled artisan to combine unrelated art as the Examiner has in combining Geiger and Chang. Nor has the Examiner provided any reasonable expectation of success as to why such a combination would work. There is no indication that methods of mercury removal would help to minimize dioxin levels as in the present invention.

As the Examiner has failed to provide a *prima facie* case of obviousness according to the above-described criteria, the claims are not obvious over the combination of Geiger and Chang. Therefore, the rejection of Claims 1-20 under 35 U.S.C. § 103(a) over Geiger taken with Chang should be withdrawn.

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being obvious over Geiger in view of U.S. Patent No. 5,439,508 to Mayer-Schwinning et al. (hereinafter "Mayer-Schwinning"). The Examiner suggests that it would have been obvious to use the waste gas purification of Mayer-Schwinning on the waste gas of Geiger in order to purify the gasses from pollutants such as acid gasses and remaining dioxins.

Mayer-Schwinning discloses the separation of dioxins and furans from exhaust gases from combustion plants, in which the dust and the gaseous pollutants HF, HCl, SO₂, and SO₃ are first substantially entirely separated from the exhaust gases, the prepurified exhaust gas is then supplied to a wet-process electrostatic precipitator, and 10 to 500 mg activated carbon powder per sm³ are added to the prepurified exhaust gas immediately before it enters the wet-process electrostatic precipitator.

The Examiner suggests that, based on In re Kamlet, 185 F.2d 709, 88 USPQ 106 (CCPA 1950), it would have been obvious to use the product of one process in a second process if the second process requires the product of the first. The Examiner asserts that the Mayer-Schwinning process requires the waste gas product of Geiger. Applicants assert that applying such a standard is misplaced. As a first matter, application of a case from 1950 to purport obviousness under 35 U.S.C. § 103(a) would seem improper as § 103 was incorporated into the patent statute as part of the 1952 patent act. Thus, the court in In re Kamlet could not have been interpreting § 103(a).

A more appropriate standard is set forth in In re Brouwer, 77 F.3d 422, 37 USPQ 2d 1663 (Fed. Cir. 1995):

The test of obviousness *vel non* is statutory. It requires that one compare the claim's subject matter as a whole with the prior art to which said subject matter pertains. The inquiry is thus highly fact-specific by design. This is so whether the invention be a process for making or a process of using, or some other process. When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. Brouwer, 77 F.3d at 425, internal quotations and citations omitted.

"[W]hen any applicant properly presents and argues suitable method claims, they should be examined in light of all . . . relevant factors, free from any presumed controlling effect of . . . any other precedent." Brouwer, 77 F.3d at 426, quoting In re Dillon, 919 F.2d 688, 695, 16 USPQ 2d 1897, 1903 (Fed. Cir. 1990) (in banc), *cert. denied*, 500 U.S. 904 (1991).

The proper standard is to apply the criteria established in Graham v. John Deere Co., 383 U.S. 1 (1966). "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." Graham, 282 U.S. at 17. In order to establish a *prima facie* case of obviousness under this standard, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. Amgen v. Chugai Pharmaceutical Co. 18 USPQ 2d 1016, 1023 (Fed. Cir. 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. In re Wilson, 165 USPQ 494, 496, (CCPA 1970). Geiger does not provide a motivation to modify the method taught, to practice the claimed invention, and obtain the results obtained by Applicants. Geiger fails to provide any teaching leading to an expectation that removing ash from the gaseous medium, adding an adsorbent to the gaseous medium thus formed, and removing acid gases and particulates from the mixture of gaseous medium and adsorbent thus formed would produce the results Applicants have obtained.

Mayer-Schwinning is directed to treating gases from combustion plants, particularly refuse incinerating plants. There is no suggestion or disclosure in Mayer-Schwinning that the use of sulfur as disclosed in Geiger would produce gases that could be treated using the Mayer-Schwinning method.

As there is no motivation or suggestion in the cited prior art to combine them as the Examiner has, the claims are not obvious over the combination of Geiger and Mayer-Schwinning. Therefore, the rejection of Claims 1-20 under 35 U.S.C. § 103(a) over Geiger taken with Mayer-Schwinning should be withdrawn.

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being obvious over Geiger in view of Onaka et al. "Development of Dioxins Removal Systems for EAF" (hereinafter "Onaka"). The Examiner suggests that it would have been obvious to use the waste gas purification of Onaka on the waste gas of Geiger in order to purify the gases from remaining dioxin pollutants.

Onaka discloses the separation of dioxins from exhaust gases from steelmaking electric arc furnaces. The purification entails the removal of dust and fly ash in a dust collector or electrostatic precipitator. The exhaust gases are then contacted with activated carbon sorbent and fed to another bag filter for removal. In making the rejection, the Examiner again relies improperly on In re Kamlet.

As indicated above, the proper standard for determining obviousness under 35 U.S.C. § 103 is set forth in Graham v. John Deere Co. as interpreted in In re Fine, Amgen v. Chugai Pharmaceutical Co. and In re Wilson.

Geiger does not provide a motivation to modify the method taught, to practice the claimed invention, and obtain the results obtained by Applicants. Geiger fails to provide any teaching leading to an expectation that removing ash from the gaseous medium, adding an adsorbent to the gaseous medium thus formed, and removing acid gases and particulates from the mixture of gaseous medium and adsorbent thus formed would produce the results Applicants have obtained.

Onaka is directed to treating gases from steelmaking electric arc furnaces. There is no suggestion or disclosure in Onaka aq


As there is no motivation or suggestion in the cited prior art to combine them as the Examiner has, the claims are not obvious over the combination of Geiger and Onaka. Therefore, the rejection of Claims 1-20 under 35 U.S.C. § 103(a) over Geiger taken with Onaka should be withdrawn.

CONCLUSION

Applicants submit that the present application is in condition for allowance. Accordingly, reconsideration of the rejections and a Notice of Allowance are respectfully requested for Claims 1-20. If the Examiner is of the opinion that the present application is in condition for other than allowance, he is requested to contact the Applicants' attorney at the telephone number given below so that additional changes to the claims may be discussed.

Respectfully submitted,

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